

## Cancer Vaccine Development: Viral Inactivation of Tumor Cells

Ref. Nos. E-303-2003 and E-135-2006

**Keywords:** Vaccine, cancer, HIV, viral inactivation, 1,5-iodoanphthylazide

### **Collaborative Research Opportunity:**

The National Cancer Institute (NCI) seeks parties to co-develop effective non-infectious formulations of vaccines that target viruses, parasites and tumor cells. Any or all of the inventions in this announcement are available for co-development and collaborative research as well as licensing.

### **Summary:**

These inventions provide simple methodologies to elicit immune responses against the epitopes of antigens specific to diseased cells. Because these antigens are normally present in the host, and therefore are not clearly recognized as foreign, targeting immune responses directly to viral or cancerous cells is a significant breakthrough.

### **Technology:**

Researchers at the National Cancer Institute (NCI) [Nanobiology Program](#) have developed a method that uses a hydrophobic cross-linking strategy to elicit immune responses to specific cancers, viruses, and parasites. The strategy employs the use of hydrophobic, photo-active tagging compounds, such as 1,5-iodoanphthylazide, as well as cross-linkers that target viruses, parasites, and tumor cells. These non-toxic compounds diffuse into the lipid bilayer of biological membranes and, upon irradiation with UV light, bind to proteins and lipids in this domain. This inactivates the fusion of enveloped viruses with their corresponding target cells. Once irradiated, this modified membrane is partially resistant to detergent solubilization. Use of this crosslinker, followed by detergent treatment, results in dual inactivation of the virus with significant preservation of the structural integrity and immunogenicity of proteins on the exterior of the inactivated virus. This technology is universally applicable to other microorganisms that are surrounded by biological membranes such as parasites and tumor cells.

### **Potential Commercial Applications:**

- Vaccines for cancer, HIV or against parasites and enveloped viruses that cause disease in humans and livestock

### **Competitive Advantages:**

- Novel methods of inactivating enveloped viruses, parasites, and tumor cells.
- May maintain native conformational structures and viral epitopes for generating an effective immune response.
- Active immune system will do a better job attacking viral/cancer cells.

### **Patent Status:**

- PCT Application No. PCT/US2005/009559 filed 22 Mar 2005; US Application No. 11/525,250 filed 21 Sep 2006
- PCT Application No. PCT/US2007/007338 filed 23 Mar 2007; US Application No. 12/225,551 filed 24 Sep 2008

**Developmental Status:** Preclinical, *in vivo* data available.

### **References:**

Inactivation of retroviruses with preservation of structural integrity by targeting the hydrophobic domain of the viral envelope, J Virol. 2005 Oct;79(19):12394-400, Raviv Y, et al. [[Pub Med Abs](#)]

### **Contact Information:**

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